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INSTALLATION INFORMATION

- **Installation History**
  - A RCRA Facility Assessment was conducted in 1988. Forty-six (46) solid waste management units (SWMUs) and seven (7) areas of concern (AOCs) were identified as having the potential for release of contaminants to the environment.
  - Thirty-one (31) SWMUs and seven (7) AOCs were listed in Part 1 of the RCRA Part B Permit as requiring RCRA Facility Investigation (RFI) studies to characterize these sites for the nature, amount, and extent of contamination. In accordance with the RCRA Part B Permit, Fort Bragg identified and evaluated an additional site at the Vocational Technical Training Area (SWMU 102), a former commercial gas station (SWMU 103), and an abandoned ASP (SWMU 104).
  - Fort Bragg has 10 Operable Units with 28 SWMUs and 5 Separate SWMUs not identified as an OU and seven AOCs identified.
  - Environmental driver for these projects in 40 CFR Section 260 and the Fort Bragg RCRA Part “B” permit.

FORT BRAGG IRP PARTNERING TEAM

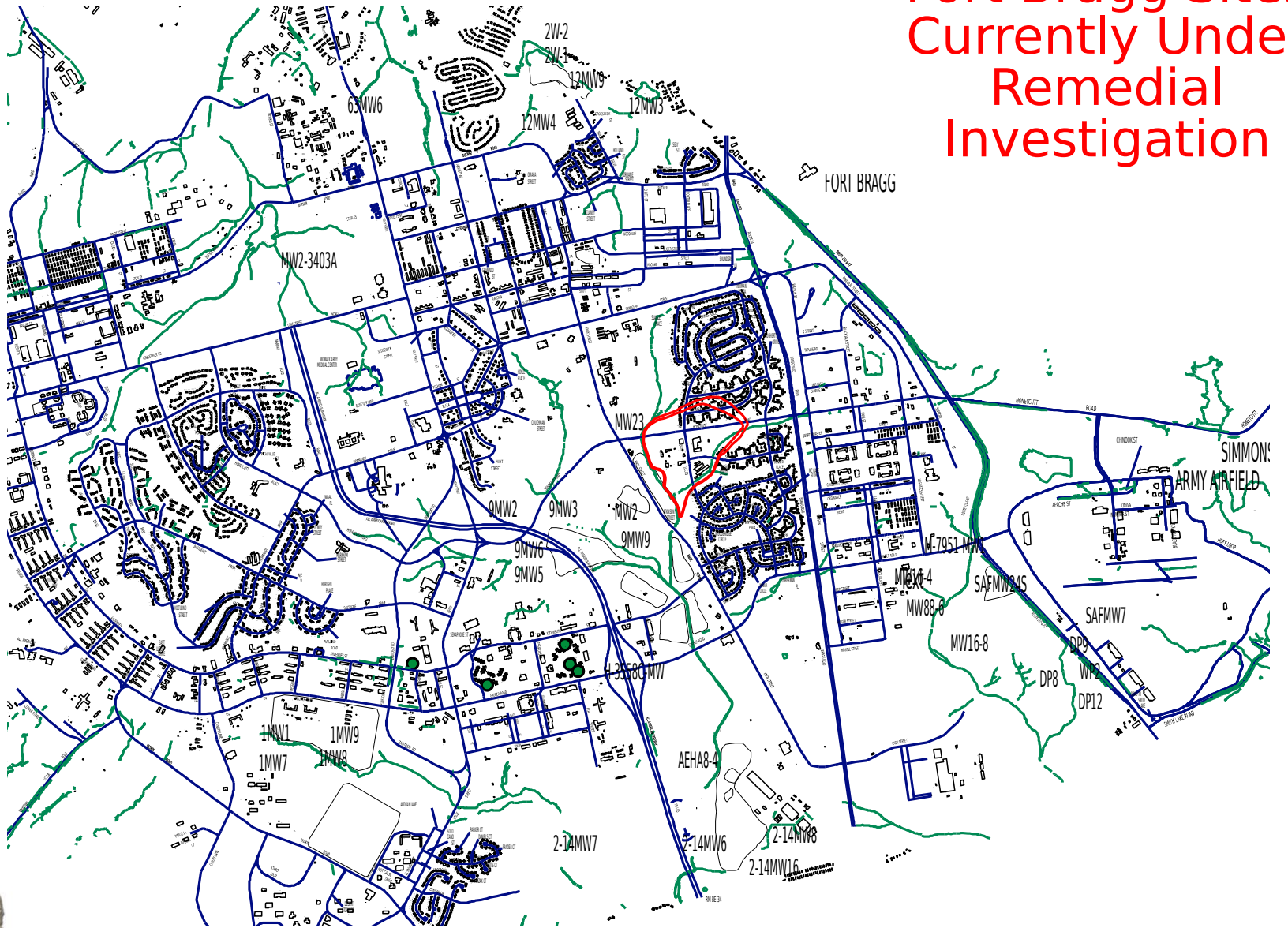
- Fort Bragg – Ed Schwacke, (910)396-3341, IRP Program Manager
  Jason Adcock, (910)396-3341, IRP Support (SAIC)

- NCDENR – Ms. Marti Morgan, (919)733-2801 x 277, Federal Remediation Branch

- U.S. Army Corps of Engineers, Savannah District
  Zainul Kidwai, (912)652-6167, Project Manager
  Ms. Sherry McCumber-Kahn, (912)652-5083, Technical Support

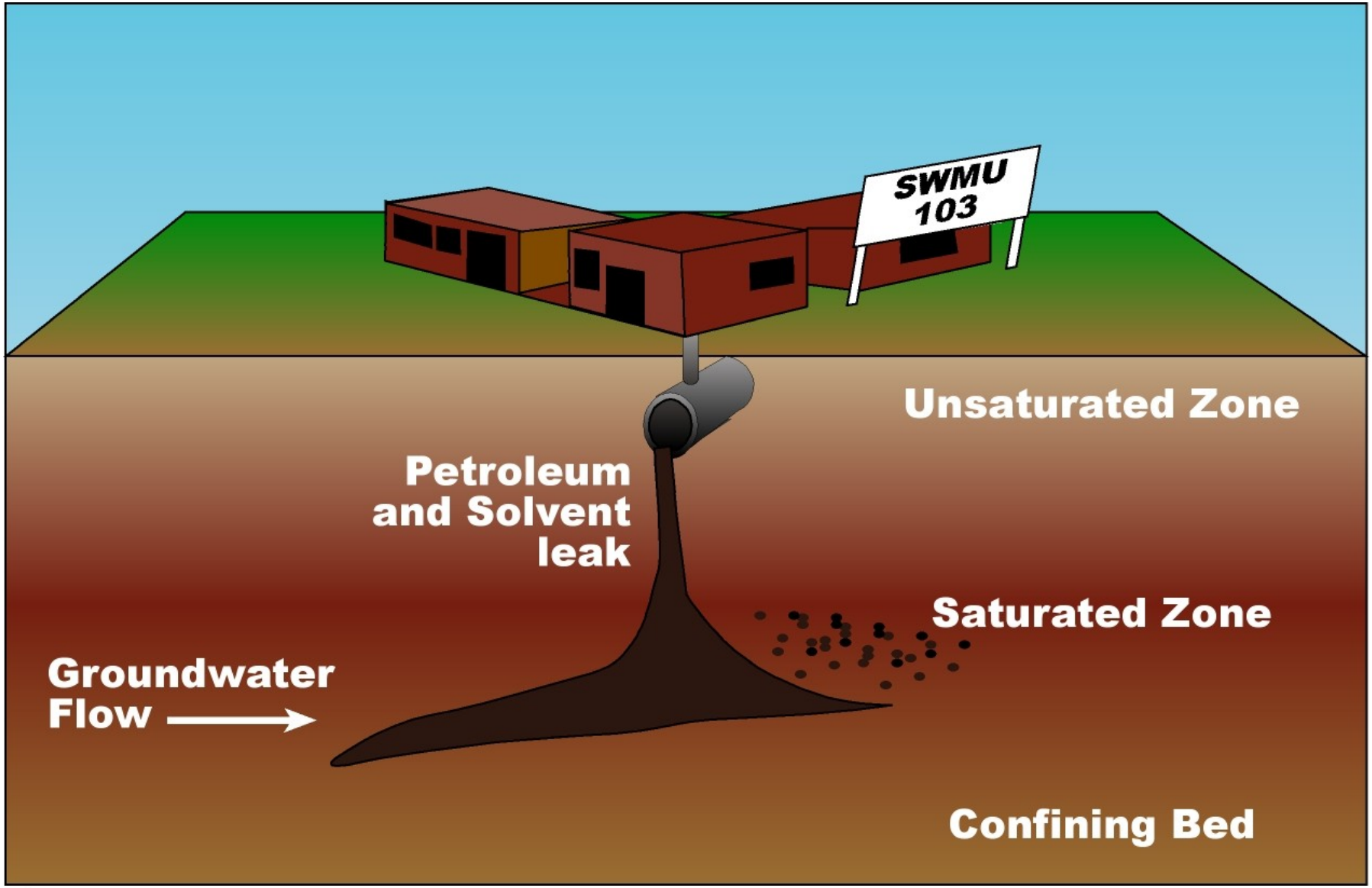
- SWMU 103 Project Consultant – SAIC, Oak Ridge, TN
  Jeff Longaker, Project Manager
  Ms. Sharon Robers, Risk Assessor____

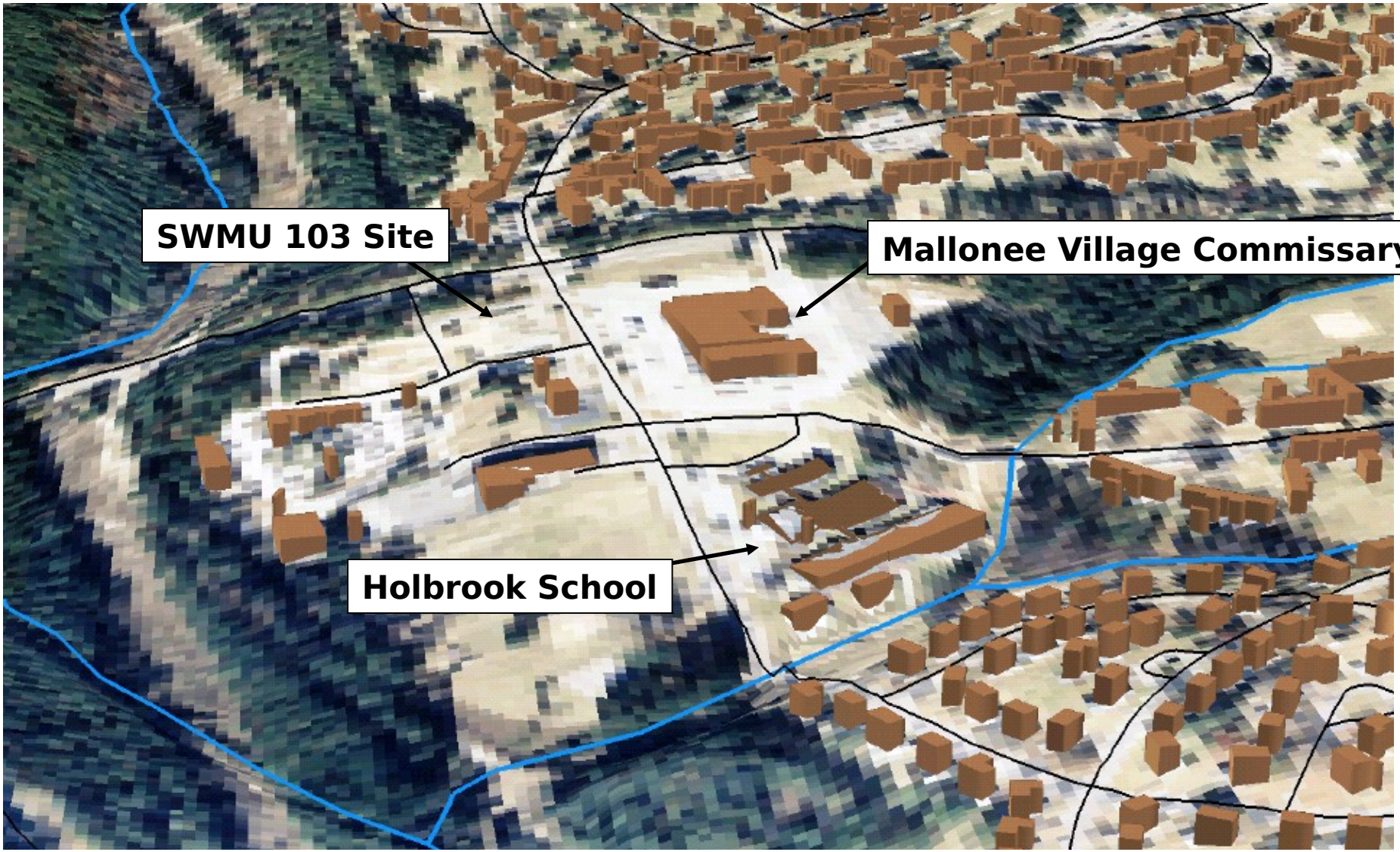
Fort Bragg Sites Currently Under Remedial Investigation



SWMU 103 – 6 ACRE SITE

- Located at the corner of Honeycutt Road and South Lucas Drive.
- Contaminants are from a solvent and petroleum USTs at a former service station.
- COCs – Chlorinated solvents in subsurface soils, groundwater, sediment, and surface water. Petroleum hydrocarbons in subsurface soils and groundwater.
- Discovered during RFI for SWMUs 4 & 18, RFI underway, Site Conceptual Model being developed. Groundwater plume is under family housing and Holbrook Elementary School.
- To date, three field investigations have been performed. The January 2003 investigation objectives were:
  1. Determine chemical and geotechnical characteristics of the clay in the source area at SWMU 103.
  2. Define the extent of impacted groundwater and define the characteristics.
  3. Define the characteristics of the shallow and deep surficial groundwater upgradient of the source and define the characteristics of the soil (2-4') below ground surface within the residential area north of the source area.


SWMU
103
Unsaturated Zone
Petroleum
and Solvent
leak
Saturated Zone
Groundwater
Flow
Confining Bed



SWMU 103 Vicinity Map

5x Vertical Exaggeration Added For Map Relief

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SWMU 103 Plume Extent

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ENVIRONMENTAL MEDIA OF CONCERN

- Groundwater
- Surface Water in Unnamed Tributary of Beaver Creek
- Sediment in Unnamed Tributary of Beaver Creek

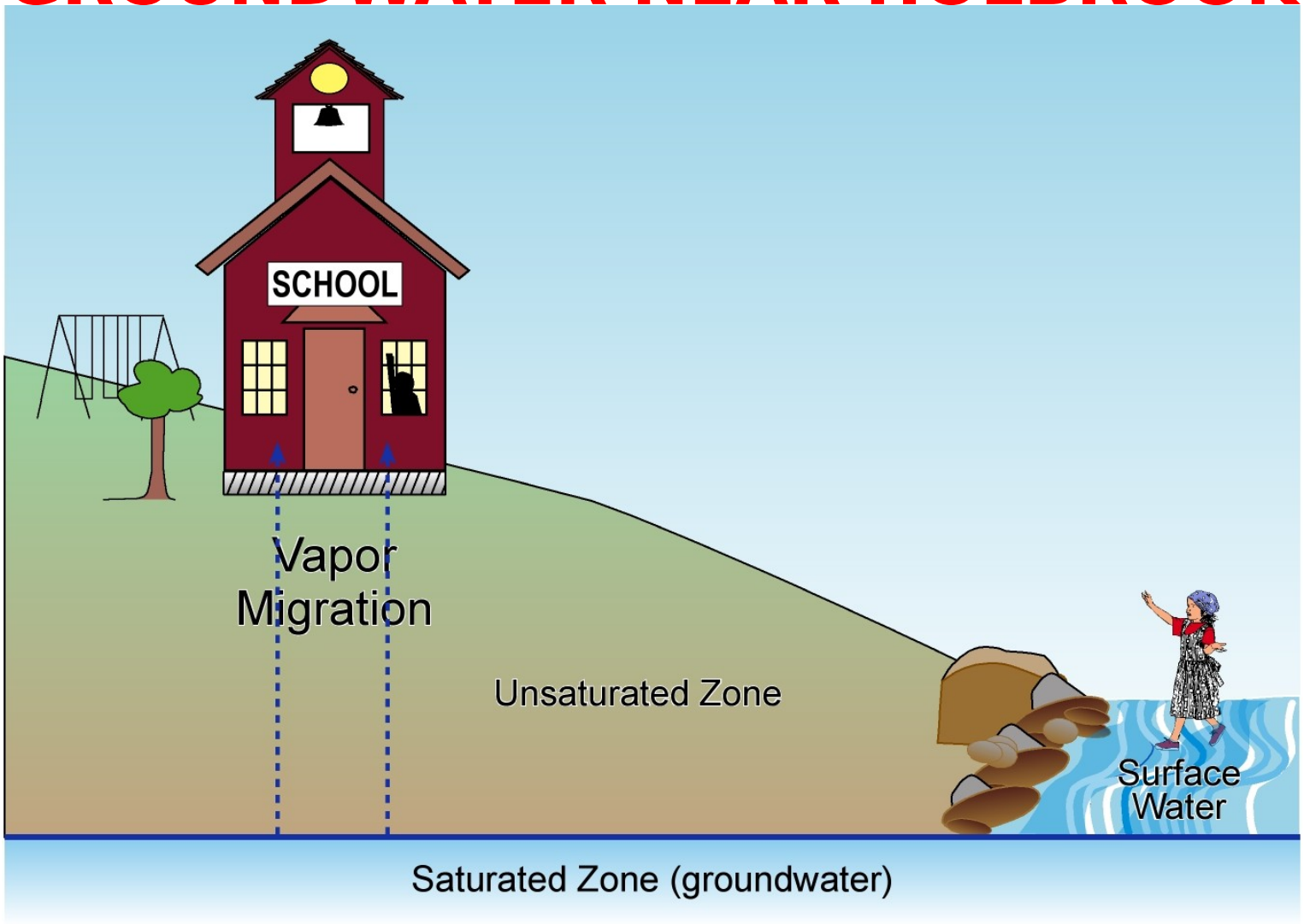
CONTAMINANTS OF POTENTIAL CONCERN BASED ON POTENTIAL EXPOSURE

- Groundwater: 1,1,2,2-tetrachloroethane, trichloroethene, (MW 35/36) chloroform, and bis (2-ethylhexylphthalate) (MW 37/38)

- Surface Water: 1,1,2,2-tetrachloroethane, chloromethane, trichloroethene, vinyl chloride, dieldrin, heptachlor epoxide, alpha-chlordane, iron, manganese, zinc, and nitrate

- Sediment: benzo(a)pyrene and arsenic

RISK ASSESSMENT FOR CHEMICALS IN GROUNDWATER NEAR HOLBROOK

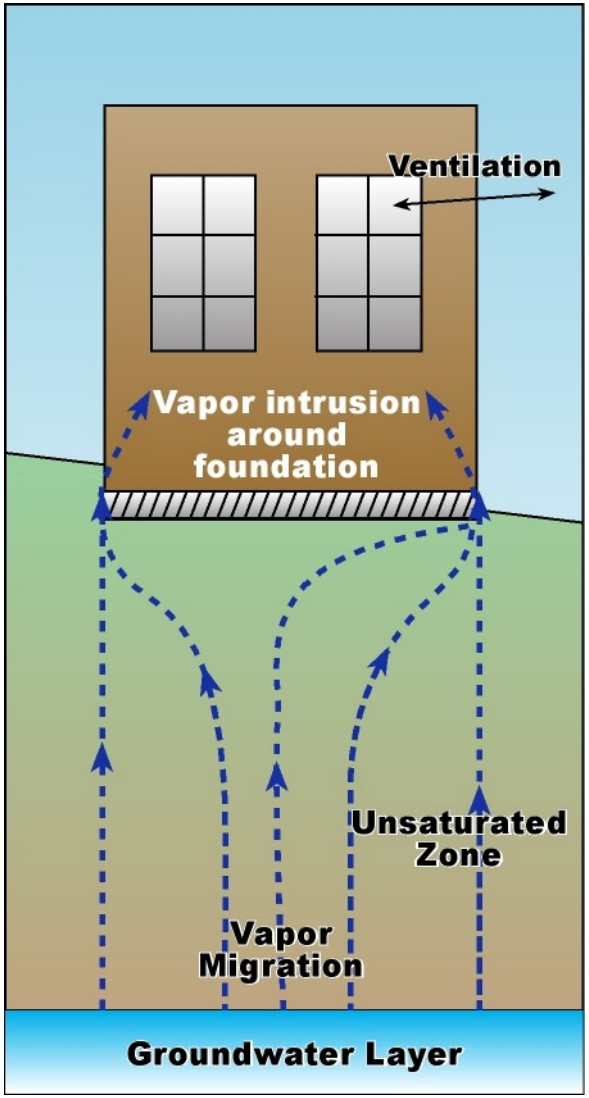


EXPOSURE PATHWAYS EVALUATED

- Groundwater: Vapor Intrusion
- Surface water: Ingestion (drinking) and physical contact (dermal)
- Sediment: Ingestion and physical contact (dermal)

VAPOR INTRUSION

- Volatile chemicals may evaporate from the groundwater and move up through the soil.
- Vapors in the soil may enter the building through cracks in the foundation.
- Use EPA recommended 3 tiered approach to evaluate whether vapor intrusion could represent a health risk.



EPA 3 TIERED APPROACH TO VAPOR INTRUSION

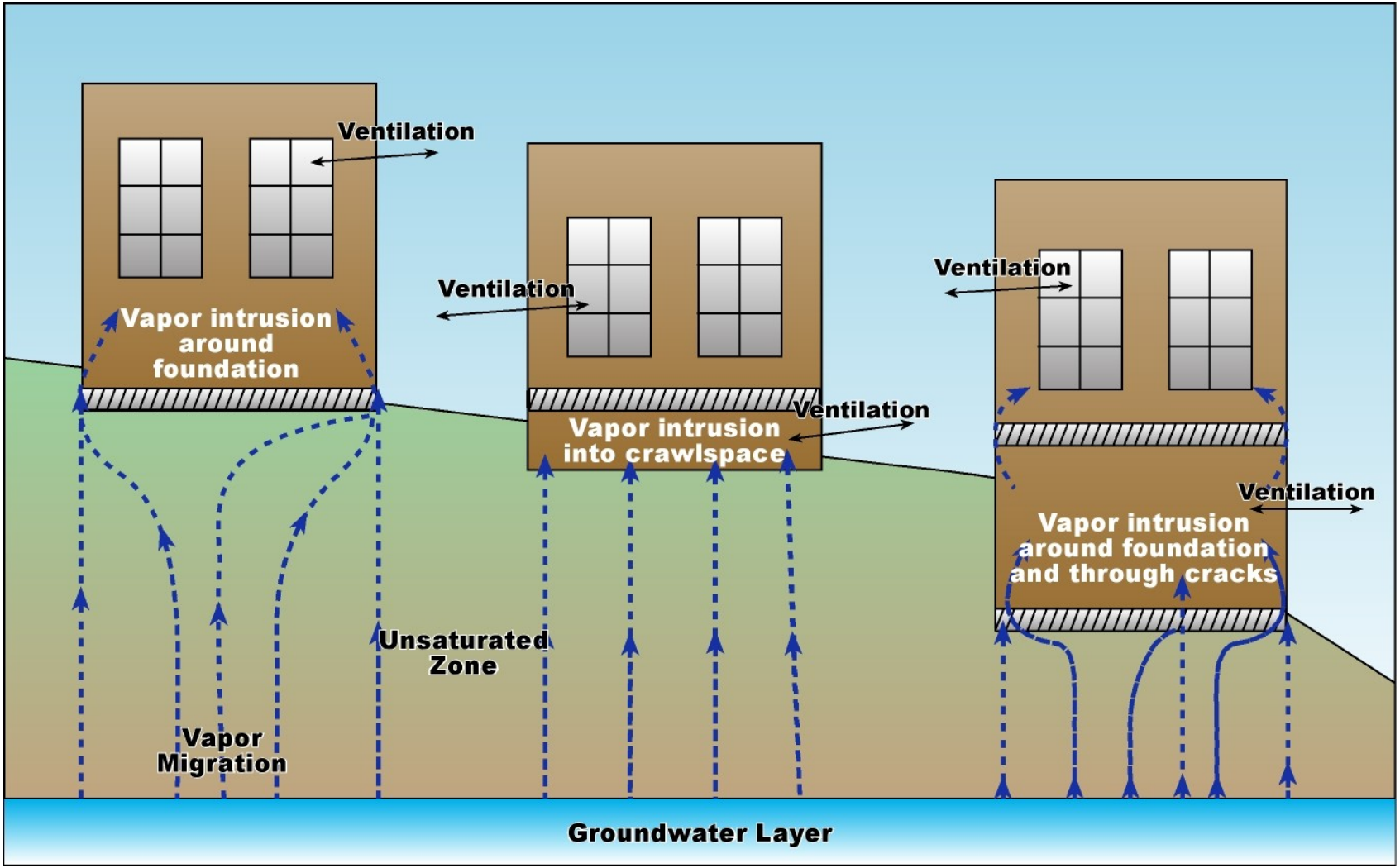
Purpose – identify potential health risks from vapor intrusion while minimizing the amount of data required.

- **Tier 1** Primary Screening
  - *Uses very general site knowledge*
- **Tier 2** Secondary Screening
  - *Uses limited site sampling data*
- **Tier 3** Site-Specific Assessment
  - *Uses detailed site-specific data*

TIER 3 SITE-SPECIFIC ASSESSMENT

- Use a mathematical model to determine acceptable groundwater concentrations based on actual conditions at the site (for example the type of soil and type of building foundation).

TIER 3 SITE-SPECIFIC ASSESSMENT



TIER 3 SECONDARY SCREENING AT HOLBROOK SCHOOL

Tier 3 Groundwater Screening Levels and Sampling Results at Holbrook Elementary School

Chemical	Maximum concentration in Shallow Groundwater Near School (µg/L)		Minimum Tier 3 Groundwater Screening Levels(µg/L)	
	MW-35	MW-37	Slab	Basement
1,1,2,2-tetrachloroethane	17	Not Detected	36	423
Trichloroethene	2.3	Not Detected	35	424
Chloroform*	Not Detected	Not Detected	80	80

**Detected in MW36 at 0.84µgL in the deep groundwater well associated with well pairMW35/MW3*

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SURFACE WATER AND SEDIMENT RISK ASSESSMENT

- Standard procedures followed (EPA guidance)
- Conservative approach

EXPOSURE PARAMETERS

Receptor: Child between ages of 7 and 16 years who comes in contact with the water and sediment twice/week all year, over a 10-year time period

Exposure Pathways: Incidental ingestion and dermal contact

Exposure Concentrations: Maximum detected concentrations

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SURFACE WATER AND SEDIMENT RISK ASSESSMENT RESULTS

Environmental Media	Potential Cancer Risk		Potential Noncancer Risk		Conclusions
	Unnamed Tributary	Minimum EPA Threshold	Unnamed Tributary	Minimum EPA Threshold	
Surface Water	8 in ten million (8E-07)	1 in one million (1E-06)	0.01	1	Below both thresholds
Sediment	4 in ten million (4E-07)	1 in one million (1E-06)	0.002	1	Below both thresholds

SUMMARY AND CONCLUSION

- Low levels of contaminants in groundwater, surface water, and sediment
- Risk from vapor intrusion of contaminants into Holbrook School from groundwater is below most stringent EPA criteria
- Risk from exposure to surface water and sediment to a trespasser/visitor are below EPA most stringent criteria.
- Site will continue to be monitored and ultimately preventative measures will be implemented as appropriate.

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